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Ref: 3423.100324.L1

24 March 2010

Derrick Dale
The Wallace House
Fitzroy Park
London
N6 6HT

Dear Derrick,

3423: THE WALLACE HOUSE, FITZROY PARK

Further to your recent information, we are pleased to present you with the calculations of our noise impact investigation for the above project.

1.0 INTRODUCTION

Following our previous Noise Impact Assessment (3423.NIA.01) at The Wallace House, Fitzroy Park, London, N6 6HT we have now undertaken calculations for the latest proposals of the air conditioning unit. This letter will summarise the findings and include the required mitigation measures to bring noise emissions of the unit to with acceptable levels in accordance with the London Borough of Camden.

2.0 REQUIREMENTS

Following our Environmental Noise Survey detailed in our previous report 3423.NIA.01 we have been able to set the noise emissions criteria as below.

The London Borough of Camden's criteria for noise emissions of new plant installations are as follows:

"Design measures should be taken to ensure that specific plant noise levels at a point 1 metre external to sensitive façades are at least 5dB(A) less than the existing background measurement (LA90) when the equipment is in operation. Where it is anticipated that equipment will have a noise that has distinguishable, discrete continuous note[...], special attention should be given to reducing the noise at any sensitive façade by at least 10dB(A) below the LA90 level."

We therefore propose to set the noise criteria as shown in Table 4.1 in order to comply with the above requirement.

	Daytime (07:00 to 23:00)	Night-time (23:00 to 07:00)
Noise criterion at nearest residential receiver (10dB below minimum L_{A90})	30 dB(A)	28 dB(A)

Table 2.1: Proposed Noise Emissions Criteria

As the units will be used in an on-demand basis, the night-time criterion of 28dB(A) will be used in this assessment.

3.0 DISCUSSION

It is understood that the plant installation is a new air conditioning unit, selected as follows:

- 1 No. of a Daikin Air Conditioning Unit type RXYSQ6P

The sound pressure levels, at 1m as provided by the manufacturer for each unit are as shown in Table 3.1*.

	Sound Pressure Level (dB) in each Frequency Band (at 1m)							
Unit	**63Hz**	**125Hz**	**250Hz**	**500Hz**	**1kHz**	**2kHz**	**4kHz**	**8kHz**
Daikin Air Conditioning Unit type RXYSQ6P	65	57	57	53	50	45	38	33

Table 3.1 Manufacturer's Sound Pressure Level at 1m

*** worst case operational modes have been used in order to provide a more robust assessment**

The proposed location of the unit is within a ground floor enclosure built into the North-west facade of Wallace House. The unit will be completely internal within a sealed closet and ventilated by meansy of an acoustically treated louvred panel that will be installed on the North-west facade as shown on indicative site plan 3423.SP2. The closest noise sensitive window has been identified as a ground floor residential window located at the South-west facade of the adjacent house, approximately 4 metres away from the louvred panel.

Due to the quiet nature of the plant surroundings, it has been deemed necessary to specify mitigation measures in order to bring noise emissions from the plant within the requirements of the London Borough of Camden.

We would recommend treating the inside of the enclosure with an absorbent material to minimise the build up of reflections. For this we would recommend a 30-50mm layer of non-flammable absorbent layer, such as rock wool or glass fibre.

Taking all acoustic corrections into consideration, including distance corrections and proposed mitigation measures, the noise levels expected at the South-west facade of the adjacent house due to the proposed plant unit would be as shown in Table 3.2. Detailed calculations are shown in Appendix B.

Receiver	Night-time Criterion	Noise Level at Receiver (due to installed plant units)
Nearest Noise Sensitive Window	28 dB(A)	28 dB(A)

Table 3.2: Noise levels and criteria at nearest noise sensitive receiver

As shown in Appendix B and Table 3.2, transmission of noise to the nearest sensitive windows due to the effects of the proposed plant installation would be expected to meet the emissions criteria set by the London Borough of Camden, provided the louvred panel of the enclosure is selected to meet the spectral attenuation values shown in Table 3.3.

	Attenuation (dB) in each Frequency Band							
Mitigation Type	**63Hz**	**125Hz**	**250Hz**	**500Hz**	**1kHz**	**2kHz**	**4kHz**	**8kHz**
Louvred Panel	8	11	14	16	18	20	17	16

Table 3.3: Spectral attenuation required from louvred panel

For Indication Purposes Only:

Typically, in order to achieve the specifications shown in Table 3.3, a 300mm deep acoustically treated louvred panel would be required.

In addition to the above assessment, further calculations will aim to assess whether the noise emissions from the proposed plant unit would be expected to meet recognised British Standard recommendations, in order to further ensure the amenity of nearby noise sensitive receivers.

British Standard 8233:1999 '*Sound insulation and noise reduction for buildings – Code of Practise*' gives recommendations for acceptable internal noise levels in residential properties. Assuming worst case conditions, of the closest window being for a bedroom, BS8233:1999 recommends 30dB(A) as being 'Good' internal resting/sleeping conditions.

With external levels of 28dB(A), the noise levels due to the proposed plant would be expected to meet 'Good' conditions, without taking attenuation from the window itself into consideration. However, according to BS8233:1999, even a partially open window offers a minimum of 10dB attenuation.

It can therefore be predicted that, in addition to meeting the requirements of the London Borough of Camden, the emissions from the proposed plant would also be expected to comfortably meet the most stringent recommendations of the relevant British Standard, even with windows being partially open. Predicted levels are shown in Table 3.4, with detailed calculations shown in Appendix B.

Receiver	'Good' Conditions Design Range – *For resting/sleeping conditions in a bedroom, in BS8233:1999*	Noise Level at Receiver (due to proposed plant)
Inside Nearest Residence	30 dB(A)	18 dB(A)

Table 3.4: Noise levels and criteria inside nearest residential space

4.0 CONCLUSION

An environmental noise survey has been undertaken at The Wallace House, Fitzroy Park, London, N6 6HT. The results of the survey have enabled criteria to be set for noise emissions from the proposed plant in accordance with the requirements of the London Borough of Camden.

A noise impact assessment has then been undertaken using manufacturer noise data to predict the noise levels due to the current proposals at the nearby noise sensitive receivers.

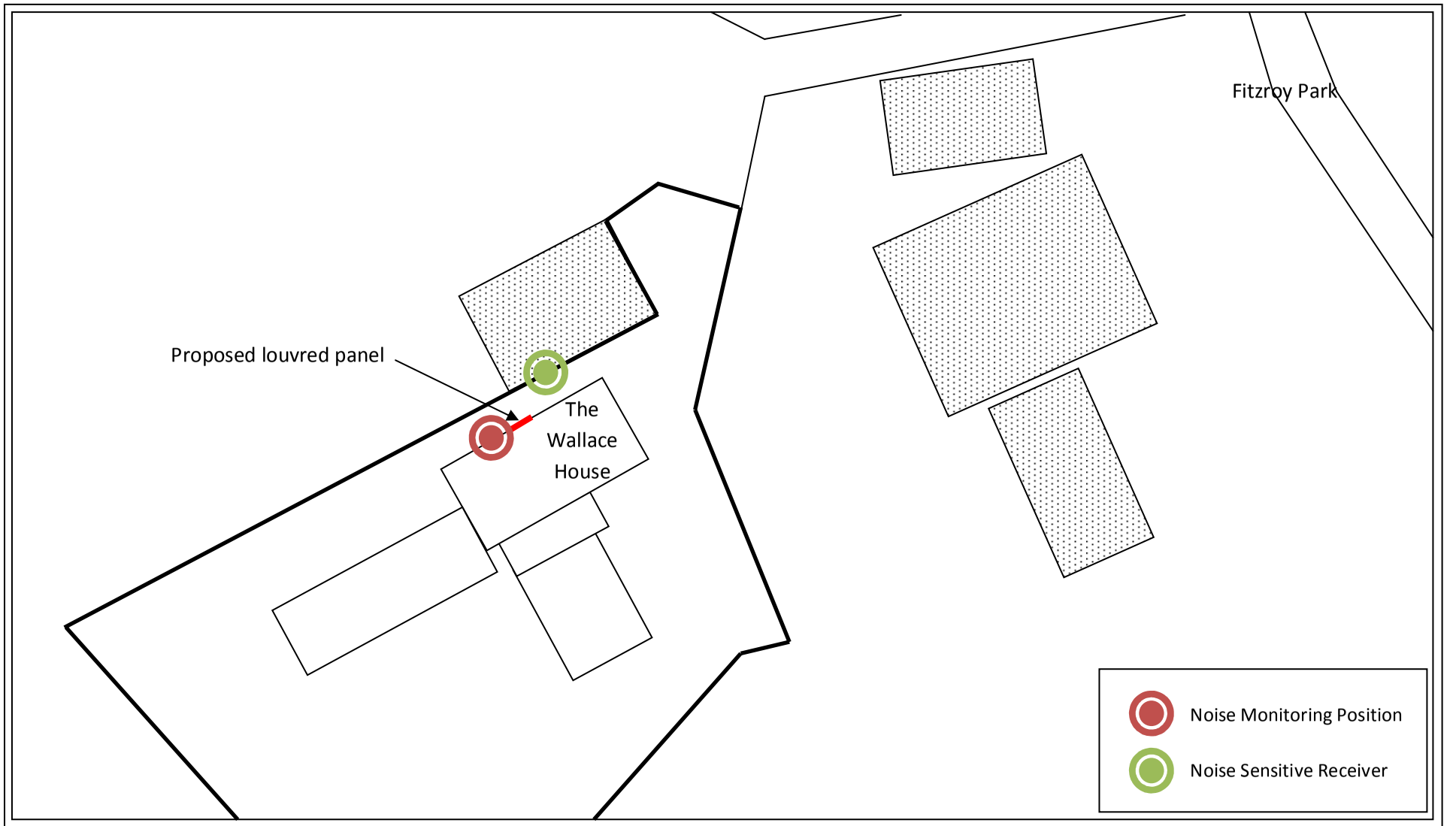
Calculations show that noise emissions from the proposed air conditioning unit would be within the requirements of the London Borough of Camden as well as meeting recommendations of a recognised British Standard, provided mitigation measures are put in place.

We trust the above is satisfactory to your requirements. Should you have any further questions, please do not hesitate to contact us.

Yours Sincerely,

Max Foster TechIOA

Practical Acoustics Ltd



Title:

Indicative site plan showing noise monitoring position and nearest noise sensitive receiver

Date: 24 March 2010

FIGURE 3423.SP2

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APPENDIX B

THE WALLACE HOUSE, FITZROY PARK

EXTERNAL PLANT NOISE EMISSIONS CALCULATION

Source: Daikin Air Conditioning Condenser Unit	*Frequency, Hz*								
	63	***125***	***250***	***500***	***1k***	***2k***	***4k***	***8k***	***dB(A)***
Manufacturer's sound pressure level at 1m									
Daikin Air Conditioning unit, type RXYSQ6P	65	57	57	53	50	45	38	33	55
Distance correction, dB (4m)	-12	-12	-12	-12	-12	-12	-12	-12	
Required attenuation from acoustic enclosure / louvred panel	-8	-11	-14	-16	-18	-20	-17	-16	
Cumulative sound pressure level at nearest residential window	**45**	**34**	**31**	**25**	**20**	**13**	**9**	**5**	**28**

Design Criterion	**28**

Receiver: Inside Nearest Residential Window Source: Daikin Air Conditioning Unit	*Frequency, Hz*								
	63	***125***	***250***	***500***	***1k***	***2k***	***4k***	***8k***	***dB(A)***
Sound pressure level outside window	45	34	31	25	20	13	9	5	28
Minimum attenuation from partially open window, dB	-10	-10	-10	-10	-10	-10	-10	-10	
Sound pressure level inside nearest noise sensitive window	**35**	**24**	**21**	**15**	**10**	**3**	**-1**	**-5**	**18**

Design Range	**30-35**